Garry oak ecosystems recovery team

Annotated Bibliography on the Ecology and Management of Invasive species:

Lamium purpureum
Purple Dead-nettle

Prepared by Lisa Dumoulin

for the Garry Oak Ecosystems Recovery Team

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Peer-reviewed sources

Baris˘ic, N., B. Stojkovic´ and A. Tarasjev. 2006. Plastic responses to light intensity and planting density in three *Lamium* species. Plant Systemics and Evolution 262: 25-36.

Abstract: In this survey plastic responses to light intensity and planting density were examined in three *Lamium* species (*L. purpureum, L. album* and *L. maculatum*). Low light intensity enhanced plant height, length and width of leaves, but reduced number of shoots and leaves, as well as root and shoot weights. Higher density resulted in smaller plants and leaves, but had significant effect on module number (shoots and leaves) only on older plants. The effect of light intensity on measured traits was greater than the effect of density, and consistent with predictions about plastic responses on light intensity variation. Generally, the three *Lamium* species differed in the magnitude but not in patterns of plasticity. However, associations of analyzed traits with fitness significantly differed among species as well as among light treatments.

Karlsson, L.M. and P. Milberg. 2008. Variation within species and inter-species comparison of seed dormancy and germination of four annual *Lamium* species. Flora 203: 409-420.

Abstract: In an ecological context, knowledge of intra-species variation in dormancy and germination is necessary both for practical and theoretical reasons.We used four or five seed batches (replicates) of four closely related annuals co-occurring in arable fields in Sweden: *Lamium amplexicaule, L. confertum, L. hybridum* and *L. purpureum*. Seeds used for experiments stemmed from plants cultivated on two sites, each site harbouring one population of each species, thereby ensuring similar environmental history of seeds. Seeds were tested for germination when fresh and after three different pre-treatments (cold or warm stratification, or dry storage) for up to 24 weeks. Seeds were also sown outdoors. Despite substantial intra-species variation, there were clear differences between species. The general seed dormancy pattern, i.e. which environmental circumstances that affect dormancy, was similar for all species; dormancy reduction occurred during warm stratification or dry storage. Even though the response to warm stratification indicates a winter annual pattern, successful plants in Sweden were mostly spring emerged. Germination in autumn occurred, but plants survived winters poorly. Consequently, as cold stratification did not reduce dormancy, strong dormancy in combination with dormancy reduction during dry periods might explain spring germination. It is hypothesized that local adaptations occur through changes mainly in dormancy strength, i.e. how much effort is needed to reduce dormancy. Strong dormancy restricts the part of each seed batch that germinate during autumn, and thus reduces the risk of winter mortality, in Sweden.

Roberts, H.A. and J.E. Boddrell. 1983. Seed survival and periodicity of seedling emergence in ten species of annual weeds. Applied Biology 102: 523-532.

Abstract: Seeds or fruits of 10 species of annual weeds were collected in each of 3 years and mixed with the top 7.5 cm of sterilized soil (confined in cylinders sunk in the ground outdoors and cultivated three times yearly. The numbers of seedlings emerging were recorded for 5 yr and the numbers of viable seeds remaining then determined. Emergence of *Anagallis arvensis, Anchusa aruensis, Chaenorrhinum minus* and *Euphorbia peplus* was mainly in spring; *Lamium amplexicaule* and *Mj'osotis arvensis* also had a spring peak but emergence continued in summer and autumn. Seedlings of *Aphanes arvensis* appeared almost entirely in autumn and those of *Lamium purpureum* between May and October. *Veronica arvensis* had spring and autumn peaks, while *Fumaria densgora* showed no definite pattern. Except for *Anagallis arvensis* and *F. densgora,* in which there was apparent innate dormancy due to the seed coat, most seedlings appeared in the first year with a decrease, usually exponential, from year to year. This was most rapid in C. *minus* and *E. peplus,* of which few viable seeds remained after 5 yr. Seed survival for the other species ranged from 2.6% of those sown for *Anchusa arvensis* to *14.8%* for *F. densflora.*

Other published sources

Horwood. A.R. 1919. *Lamium purpureum* in British Wild Flowers - In Their Natural Haunts Vol2-4. The Gresham Publishing Company, London, UK. Available online: http://chestofbooks.com/flora-plants/flowers/British-Wild-Flowers-1/Purple-Dead-Nettle-Lamium-Purpureum-L.html [Accessed August 31, 2010].

Shires, S.W., L.A. Bourdouxhe, A.R. Corssman, B. Genot, J.P. Laffranque and J. Leblanc.1997.Carfentrazone-ethyl: A new herbicide for the rapid control of key cereal broad-leaf weeds. Brighton Crop Protection Conference – Weeds, Conference Proceedings Volume 103: 117-122.

Abstract: Carfentrazone-ethyl (F8426) is a protoporphyrin oxygenase (PPO) inhibitor that is being developed for the control of weeds in cereals and other crops. Extensive field trials conducted in the major cereal producing countries of Europe have confirmed :
- outstanding activity against *Galium aparine* and some other key cereal broad-leaf weeds, eg *Veronica hederifolia*, *Lamium purpureum*, *Sinapis arvensis*:
- very low recommended dose rates (20 g ai/ha);
- rapid action, resulting in weed mortality within a few days after application;
- excellent crop selectivity in small grain cereal varieties.
It is concluded that optimum control of *G. aparine* can be obtained by applying 20 g a.i./ha of carfentrazone-ethyl between crop stages 13 to 32 on weeds less than or equal to 20cm high.

Douglas, G.W., D. Meidinger and J. Pojar (Eds.) 1999. Illustrated flora of British Columbia Volume 3 Dicoltyledons (Diapensiaceae through Onagraceae). Ministry of Environment, Lands and Parks and Ministry of Forest: Victoria, BC. p.266.

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ARKive. 2010. Red dead-nettle (*Lamium purpureum*). In: Plants and Algae. www.arkive.org/red-dead-nettle/lamium-purpureum/. ARKive Images of Life on Earth.

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Bond, W. and R. Turner. 2007**.** The biology and non-chemical control of Red Dead-nettle *(Lamium purpureum* L.). www.gardenorganic.org.uk/organicweeds/downloads/lamium%20purpureum.pdf HDRA the organic organization, Ryton Organic Gardens, Coventry, UK.

E-flora. 2010. *Lamium purpureum* L. In: Klinkenberg, B. (Editor). E-Flora BC: Electronic Atlas of the Plants of British Columbia [eflora.bc.ca]. Lab for Advanced Spatial Analysis, Department of Geography, University of British Columbia, Vancouver, BC.

Sokolova, T.D. 2009. Weeds: *Lamium pupureum*. In: Agro Atlas. www.agroatlas.ru/en/content/weeds/Lamium_purpureum/. Interactive Agricultural Ecological Atlas of Russia and Neighbouring Countries.

Tenaglia, D. 2007. *Lamium purpureum* L. In: Pink Flowers Leaves Opposite. www.missouriplants.com/index.html.

United States Department of Agriculture. 2010. Plant Profile: *Lamium purpureum* L. Purple dead-nettle. In: USDA Plants Database. http://plants.usda.gov/index.html. United States Department of Agriculture Natural Resources Conservation Service.

Virginia Cooperative Extension. Red dead-nettle *Lamium purpureum.* In: Virginia Tech Weed Identification Guide. www.ppws.vt.edu/weedindex.htm. Virginia Tech College of Agriculture and Life Sciences. [Accessed online: September 2, 2010].